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ABSTRACT

This study involved over 4,000 third grade students in a large (90,000+) suburban-emerging-urban school district. The purpose of the study was to examine the effectiveness of curriculum alignment on student achievement in mathematics as measured by the Iowa Tests of Basic Skills (IOWA) after one year of implementation in the DeKalb County School System. Curriculum alignment was the treatment or independent variable in the study: the misalignment traditionally associated with classroom instruction and test items on standardized tests. The topic of curriculum alignment is sparsely represented in the literature; however, upon careful examination and extrapolation, a richer historical background emerges. This study presents a new model which depicts the four-pronged historical roots of curriculum alignment in Effective Schools Research, measurement/standardized testing, curriculum, and Learning Theory. Within these four areas was found a common mantra: what is taught should be tested and what is tested should be what is taught. As simple as it may sound, this quest, originating from dissimilar camps, has struggled for legitimacy. The struggle to legitimize curriculum alignment is centered around the use of standardized tests to sort and/or eliminate groups of people with score cut-offs and/or program eligibility requirements. The lack of support from some educators emanates from the use of test scores to quantify accountability. This study focused on the variables that serve as known predictors of poor performance on standardized tests--poverty, race, gender and school size. Therefore, one of the key issues of this study is whether equity is a by-product for the alignment process. There were five research questions with parallel null hypotheses. The statistics used to examine these hypotheses were a t-test and ANOVA. Of the five hypotheses examined, one proved statistically significant. There was a statistically significant difference in the overall scores of matched third grade students on the IOWA after one year of implementation of curriculum alignment with a national curve equivalent (NCE) mean gain of 5.12 points in mathematics. According to the results, curriculum alignment appears to be an effective strategy in increasing student achievement in mathematics with third graders. It also appears to weaken the predictability of variables in student performance, namely, socioeconomic status, race, gender, and school size, since there was no statistically significant difference in the academic growth within the categories of the intervening variables. For these reasons, the study concludes with a reference to curriculum alignment as a potential curriculum equalizer. Educators are given an additional responsibility as

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researchers to go beyond the results to study implications and long-term effects as it relates to the specific needs of disadvantaged children. With that in mind, it should be noted that the emergence of curriculum alignment as a strategy to improve test scores may not be congruent to efforts to improve the quality of instruction. Curriculum planners must be vigilant in their scrutiny of the worthiness of that to which instruction is being aligned. Nevertheless, children deserve to know and study the criteria by which they are to be measured. (Contains 11 references.) (Author/CCM)

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Paper Presented: American Educational Research Association Annual Meeting Montreal, Canada

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By
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April 20, 1999

ABSTRACT

This study involved over 4,000 third grade students in a large (90,000+) suburban-emerging-urban school district. The purpose of the study was to examine the effectiveness of curriculum alignment on student achievement in mathematics as measured by the Iowa Tests of Basic Skills after one year of implementation in the DeKalb County School System. Curriculum alignment was the treatment or independent variable in the study: the misalignment traditionally associated with classroom instruction and test items on standardized tests.

The topic of curriculum alignment is sparsely represented in the literature; however, upon careful examination and extrapolation, a richer historical background emerges. This study presents a new model which depicts the four-pronged historical roots of curriculum alignment in Effective Schools Research, measurement/standardized testing, curriculum, and Learning Theory(Appendix A). Within these four areas was found a common mantra: what is taught should be tested and what is tested should be what is taught.

As simple as it may sound, this quest, originating from dissimilar camps, has struggled for legitimacy. The struggle to legitimize curriculum alignment is centered around the use of standardize tests to sort and/or eliminate groups of people with score cut-offs and/or program eligibility requirements. The lack of support from some educators emanates from the use of test scores to quantify accountability. This study focused on the variables that serve as known predictors of poor performance on standardized tests--poverty, race, gender and school size. Therefore, one of the key issues of this study is whether equity is a by-product for the alignment process.

There were five research questions with parallel null hypotheses. The statistics used to examine these hypotheses were a t-test and ANOVA. Of the five hypotheses examined, one

proved statistically significant. There was a statistically significant difference in the overall scores of matched third grade students on the IOWA after one year of implementation of curriculum alignment with NCE mean gain of 5.12 points in mathematics.

According to the results, curriculum alignment appears to be an effective strategy in increasing student achievement with third grad in mathematics. It also appears to weaken the predictability of variables in student performance, namely, socioeconomic status, race, gender and school size, since there was no statistically significant difference in the academic growth within the categories of the intervening variables. For these reasons, the study concludes with a reference to curriculum alignment as a potential curriculum equalizer.

As educators, we are given an additional responsibility as researchers to go beyond the results to study implications and long-term effects as it relates to the specific needs of disadvantaged children. With that in mind, it should be noted that the emergence of curriculum alignment as a strategy to improve test scores may not be congruent to efforts to improve the quality of instruction. Curriculum planners must be vigilant in their scrutiny of the worthiness of that to which instruction is being aligned! Nevertheless, children deserve to know and study the criteria by which they are to be measured.

PURPOSE/STATEMENT OF THE PROBLEM

The purpose of this study was to examine the implications for educational administrators of effectiveness of the DeKalb County School System's curriculum alignment, after one year of implementation, as measured by the Iowa Tests of Basic Skills performance of third graders in mathematics. Although the DeKalb County School System aligned its science, social studies, and mathematics curriculums in K-6th grades, the scope of this study focused on one grade--

third, and one curriculum area, mathematics. Another purpose of this study was to measure third grade student responses on the mathematics portion of the Iowa Tests of Basic Skills when analyzed by socioeconomic status of students. With a new emerging state curriculum, these data will be used to structure the framework for additional revisions in local curriculum development. As a field-based study, these data will provide needed insight on the effectiveness of the curriculum alignment process as a strategy to improve test scores in the DeKalb County School System (O'Rourke, 1997). The results of this study will provide local educational leaders additional information on the effectiveness of curriculum alignment as a tool for improving test scores with disaggregated data related to gender, school size and race.

RESEARCH METHODOLOGY

Design of the Study

The study of the effects of curriculum alignment on the mathematics achievement of third graders in the DeKalb County School System was a quantitative descriptive study. A one-group pretest-posttest design was used 0_1 X 0_2. The Iowa Tests of Basic Skills mathematics section of the standardized test scores for 1996 served as the pretest 0_1. The usage of curriculum alignment in the classrooms was the treatment X. The Iowa Tests of Basic Skills mathematics section of the standardized test scores for 1997 served as the post test 0_2. Since it was assumed that the entire population of regular education third graders in the DeKalb County School System was exposed to curriculum alignment, there was no control group. Students retained in the third grade for the 1996-1997 school year along with non-English speaking students were no included in the study.

Description of the Setting

The DeKalb County School System was the largest school system in the state of Georgia, until the 1996-1997 school year, when it surrendered its title to Gwinnette County School System. DeKalb is part of the 23 metropolitan county area of Atlanta. Whereas, it is a suburban area of Atlanta, it is quickly becoming urbanized in many respects. The county is majority Caucasian, however, the schools are majority African- American. DeKalb County boasts of being the second highest per-capita income for African-Americans in the country (Atlanta Regional Commission, 1995).

Sampling Procedures

The population were all third grade students in the DeKalb County School System tested during the 1997 session, who could be matched to their 1996 Iowa Tests of Basic Skills scores in mathematics. This excluded retainees and student who do not speak English. This study used all in the elementary schools in the DeKalb County School System using designated groups of high socioeconomic status (0-25% free and reduced lunch recipients), medium (26-49% free and reduced lunch recipients), and low (50-100% free and reduced lunch recipients). The low socioeconomic status schools did not include the twelve elementary schools which were involved in the School Improvement Initiative Schools Project. Whereas, there was a deliberate attempt to control the groupings by socioeconomic status, there was no attempt to control for the sample for school size, race or gender.

Working with Human Subjects

Permission to conduct the study was requested through the DeKalb County School System. The permission granted was contingent upon the anonymity of the schools.

Description of the Instruments

Riverside Publishing Company produces, distributes and generates scores for the Iowa Tests of Basic Skills. The Iowa Tests of Basic Skills are given by levels from 5-14 which correlate to approximate chronological ages within grade levels. For the purposes of this study, data generated from Level 8 for second grade students in the DeKalb County School System during the 1996 test session and Level 9 for third grade students from 1993-1997 was analyzed. The Iowa Tests of Basic Skills for second graders (Level 8) contains eleven smaller tests of the total battery of 378 questions. The total test, referred to as the complete battery, takes 4 hours and 35 minutes to finish. A week may be used to finish the complete battery. For the purposes of this study, three of the smaller tests, which measure mathematics achievement, were used. A math total score was used which combines these three smaller tests-- mathematics concepts and mathematics problems, and mathematics computations.

The Iowa Tests of Basic Skills for third grades (Level 9) contains 13 smaller tests. There are four smaller tests specifically related to mathematics. The complete battery takes 5 hours and 10 minutes to finish. Riverside recommends that the testing sessions be continued over a period of a week. For purposes of this study, three of the smaller tests, which measure mathematics achievement, were used. A math total was used which combined these three smaller tests--mathematics concepts and estimation, mathematics problem solving and data interpretation and mathematics computation (Riverside, 1994).

Riverside Publishing Company generates several types of scores-- raw scores, percent correct, grade equivalency, standard scores, percentile rank, stanine, and normal curve equivalent. The national curve equivalent (NCE) scores were used in this study to compare

second grade student scores in 1996 to their matched third grade scores in 1997 following one year of curriculum alignment.

According to Riverside these comparisons using NCE scores are statistically appropriate.

> " These scores also are normalized standard scores. They have a mean of 50 and a standard deviation of 21.06 in the larger norm group from which they are derived. NCEs range from 1 to 99. Because NCEs cover the same score range as percentile ranks (1-99), the two types of scores are sometimes mistakenly interchanged. NCE scores can be interpreted in much the same way as percentile ranks, but unlike percentile ranks, it is appropriate to average NCEs when describing group performance or checking growth over time (Riverside, 1994 55)."

In essence, NCE scores remain constant from year to year when there is one year of academic growth. Any change in NCE scores indicates more or less than expected growth for one year.

Validity and Reliability

Test validity and reliability were established through the University of Iowa with Riverside Publishing Company of the Houghton Mifflin Company (1994). According to the publishers, the validity of the testing materials is also a function of the local testing administration process. Riverside Publishing (1994, inside cover) company states, "It is important not to provide an opportunity for any student to have access to the test and thus have an advantage over other students prior to the administration of the test. This exposure to the norm-referenced achievement test would invalidate scores."

Data Collection Procedures
Preparation and Implementation of the Treatment

The curriculum alignment process started in the DeKalb County School System in February 1996. In response to a new superintendent's vision to improve student achievement as measured by standardized test scores, a team for the School Improvement Initiative Project (SIIP)

attended a lecture sponsored by the Georgia Association of Supervision and Curriculum Development which featured Dr. Fenwick English addressing issues related to testing and curriculum.

After studying the processes involved in aligning the curriculum, it was decided that the assistance of a consultant firm was needed to assist with this mammoth task. The firm that was used was Evans Newton Incorporated. The subject area selected was mathematics. Evans Newton Incorporated presented their product to administrative teams from the twelve designated SIIP Schools. Four of the schools adopted the Evans Newton Incorporated "package" which included intense staff development, monitoring and managing. Whereas, the original intent of the team that attended the seminar was to focus on a group of twelve SIIP schools, the general rationale for curriculum alignment was later applied to all students in three curriculum areas: mathematics, science, and social studies. Teachers and instructional coordinators completed this task under the direction of Dr. Fannie Tartt, Executive Director of Instruction for Elementary Schools. Following the English Model for the alignment process, the approach was to begin with the textbook.

English's Curriculum Alignment Process Model (Appendix B)

There were three steps used in the curriculum alignment process. The first step involved the identification of district goals. The second step, and the heart of the process involved the correlation of the textbook with the assessment tool, the Iowa Tests of Basic Skills in this instance. This phase took place over a period from April through June of 1996. The Houghton Mifflin Mathematics, 1995 Edition was correlated to the Iowa Tests of Basics Skills. Objectives were to match the textbook in a meaningful way. Twenty three percent of the content in the

textbook did not match.

Why was there so much emphasis on the textbook? For years in early American education the textbook was the curriculum, (Romanowski, 1995). The strong tendency for teachers to rely on the textbook for day to day instruction continues (Romanowski, 1995). This reliance on textbooks according to Romanowski,

> " is the strong tradition in American culture of using the printed word to transmit and protect "important" knowledge. We trust books as true and objective-especially textbooks, which have scholarly and governments' stamps of approval. Students, even more than teachers, come to view their textbooks as the ultimate authority for what is true and 'what counts.'" It is estimated that at least 75% of a student's classroom time is involved with the textbook (Romanowski, 1995, 38).

The third step of the curriculum alignment process was to design and/ or reference meaningful materials for all DeKalb teachers to used. This process was referred to as filling in the "gaps."

Test Results

The Iowa Tests of Basic Skills was administered in the spring of 1996 and 1997. Riverside Publishing provided the DeKalb County School System with school (building) averages of all scores. The data collection for the purposes of this study involved gathering (building) averages for comparisons. These data represented the aggregate scores of the over 6000 third grade students, by school, in the DeKalb County School System. As previously mentioned, the scores of twelve schools were removed because of intense restructuring plans implemented for the 1996-1997 school year.

Statistical Applications

There were two statistical procedures used to analyze the effects of curriculum alignment a t-test and ANOVA to compare two groups of third graders using the same Iowa test.

A t-test was used to test Ho1, and an ANOVA was used to test Ho 2-4. The overall scores of the matched third grade students were analyzed using a t-test. By comparing the scores of matched second graders, the effectiveness of curriculum alignment was analyzed after one year of treatment with three groups--high, medium and low socioeconomic levels. Race, gender and school size were also analyzed as they are known predictors for student achievement. Hypotheses were accepted and/or rejected at the <.05 level of confidence.

LIMITATIONS AND ASSUMPTIONS

Limitations

The literature describes the same population of students who consistently perform low on standardized tests in a variety of ways--at-risk, urban youth, minority students, less-advantaged, economically disadvantaged, low socioeconomic, poor, African-American, Black and/or Hispanic. This challenges comparative analysis.

Another limitation of the study had to do with the adequacy of standardized testing to measure the performance Black/African American students. Hilliard (1987), sees two areas where traditional standardized testing needs to be modified to accommodate African American students. Hilliard points out that assessment must take cultural differences into account if it is to be scientific. He also points out the history of oppression that may yield indicators through testing *not* related to ability. Further, Hilliard also challenges the ability of these instruments to adequately measure the achievement/performance level of *any* student. The argument that some of these tests do possess cultural, social and gender biases have been often made by Hilliard and other critics of norm-referenced assessments.

Also related to limitations found with the mechanism for measurement was the behavior of normed tests with relationship to the age of the norm. The earlier the norm date: the more scores skew to the right. This is an unavoidable statistical phenomena.

Another limitation had to do with the changes within the DeKalb County School System. A new superintendent took the leadership in January of the 1995-96 school year. With the new leadership there were twelve target schools--School Improvement Initiative Project (SIIP) schools. These schools participated in restructuring during the 1996-1997 school year. These twelve SIIP schools are low socioeconomic schools; however, they were excluded from the population of low schools because of the special attention and support that they received in their restructuring efforts.

A key limitation had to do with teacher behaviors and student achievement. During the Effective Schools Research era there was a plethora of information relating teacher behaviors to student achievement. These included: Good & Brophy, 1984; Duke, 1987; Joyce, & Weil, 1980; Fisher, Berlinger, Filby, Marliave, Cahan, & Dishaw, 1980; Hunter, 1984). In a synthesis of this body of research, Duke (1987) concluded that capable teachers participate in planning, instruction, classroom management, progress monitoring, and clinical assistance. Subsequent to the Effective Schools Research, there were clearly defined implications for classroom teachers, Irvine (1990, xvii- xix) discusses teacher expectation theory and cultural synchronization especially as it relates to the achievement of black students.

> "Lack of cultural synchronization and negative teacher expectations result in hidden, often unintended, conflict between teachers and their students. . . .the teacher expectancy theory states that teachers form expectations for student achievement and thus treat students differentially because of these expectations. Over time, students begin to behave in ways that are consistent and reinforcing of the teachers's expectations, behavior that

> results in either positive or negative outcomes related to academic achievement, self-concept, motivation, aspirations, conduct and teacher-student interactions...Cultural synchronization is rooted in Afrocentricity and the cultural distinctiveness of Afro-American life. . . . Because the culture of black children is different and often misunderstood, ignored or discounted, black students are likely to experience cultural discontinuity in schools, particularly schools in which the majority, or Eurocentric persons, control, administer or teach."

This commentary would bear relevance in the study which was situated in the DeKalb County School System where the majority of the teachers in every elementary school are *not* African-American.

Assumptions

One major assumption is that teachers of third grade students used the curriculum alignment that was issued, mandated and taught to all elementary staffs in the DeKalb County School System. Using a generalization from the Mehrens and Kaminsky ethics continuum (1989) and the Bright, (1992) studies of teacher attitudes toward test preparation practices, curriculum alignment for the DeKalb County School System falls within the acceptable range for most teachers. Another assumption is that norm-referenced standardized tests generate a bell-curve based on experiences other than those solely in the classroom are being measured. The final assumption is that poverty causes children to have fewer experiences that are measured on norm-referenced standardized tests--thus, producing lower scores in disproportionate numbers (English, 1992).

ANALYSIS OF THE DATA

Introduction

This purpose of this study was to examine the effects of curriculum alignment on the student achievement of third graders as measured by the Iowa Tests of Basic Skills in mathematics. The measure of effectiveness was taken after one year of treatment using the pre- and post-test scores of third grade students. It was predicted, based on current research and data, that curriculum alignment would be an effective instructional delivery model to increase student achievement. It was predicted that this effectiveness would be statistically significant in lessening the strongholds of socioeconomic level, race, gender and school size respectively.

The null hypotheses were tested to determine if there would be a statistically significant difference in the various known predictors of low scoring patterns. Each hypothesis, stated in the null, follows with its corresponding table reflecting the data resulting from t-test or Analysis of Variance, ANOVA.

Ho1

Ho1 There is no statistically significant difference in the performance of third grade students in mathematics on a pre and post curriculum alignment basis (1996-1997) as measured by the Iowa Tests of Basic Skills using NCE scores for 1996 in comparison to matched NCE scores for 1997.

TABLE 4

T-TEST OF THE EFFECTS OF CURRICULUM ALIGNMENT COMPARING THE MEANS OF DIFFERENCES OF PRE AND POST TEST NCE SCORES

Variable	Number	Mean	Standard Deviation	Standard Error	F Value	2-tail Prob.
Pre	67	51.5701	10.044	1.227	1.05	.852
Post	67	56.6955	9.815	1.199		

Pooled Variance Estimate		
t Value	df	2-tail Prob.
-2.99	132	.003

Using a Pooled Variance estimate the analysis yielded, a t-value of -2.99, degrees of freedom at 132, and a level of probability of .033. Since the level of probability is less than .05, the difference in the score is statistically significant. The null hypothesis is, therefore, rejected.

Ho2

Ho2 There is no statistically significant difference in the performance of third grade students in mathematics on a pre and post curriculum alignment basis (1996-1997) as measured by the Iowa Tests of Basic Skills when analyzed by socioeconomic levels using NCE scores for 1996 in comparison to matched NCE scores for 1997.

TABLE 5

ONE-WAY ANALYSIS OF VARIANCE OF THE EFFECTS OF CURRICULUM ALIGNMENT COMPARING THE MEANS OF DIFFERENCES OF PRE AND POST TEST NCE SCORES WHEN ANALYZED BY SES

Source	df	Sum of Squares	Means Squares	F Ratio	F Prob.
Between Groups	2	8.7938	17.7142	.2842	.7809
Within Groups	64	1133.7080	4.3969		
Total	66	1142.5018			

Groups	Count	Mean	Standard Deviation	Standard Error
Group 1 low SES	45	5.0133	4.1601	.6202
Group 2 mod SES	15	5.8400	4.3212	1.1157
Group 3 high SES	7	4.8000	4.2973	1.6242
Total	67	5.1761	4.1606	.5083

*Significant beyond .05

Thea analysis yielded an F ratio (0.2482) and as F probability (.0846) which was not significant at the .05 level. The null hypothesis is, therefore, accepted.

Ho3

Ho3 There is no statistically significant difference in the performance of third grade students in mathematics on a pre and post curriculum alignment basis (1996-1997) as measured by the Iowa Tests of Basic Skills when analyzed by race using NCE scores for 1996 in comparison to matched NCE scores for 1997.

TABLE 6

ONE-WAY ANALYSIS OF VARIANCE OF THE EFFECTS OF CURRICULUM ALIGNMENT USING THE MEANS OF DIFFERENCES OF PRE AND POST TEST NCE SCORES WHEN ANALYZED BY RACE.

Source	df	Sum of Squares	Mean Squares	F Ratio	F Prob.
Between Groups	1	89.0971	89.097	3.0194	.0846
Within Groups	130	3836.0528	29.5081		
Total	131	3925.1499			

Groups	Count	Mean	Standard Deviation	Standard Error
Group 1 (black)	67	4.8582	4.2369	.5176
Group 2 (non black)	65	6.5015	6.4363	.7983
Total	132	5.6674	5.4738	.4764

The unequal count of the schools in the matching of 1996 and 1997 scores is the result of the opening of two all-black schools. The analysis yielded an F ratio (3.0194) and an F probability (.0846) which was not significant at the .05 level. The null hypothesis is, therefore, accepted.

Ho4

Ho4 There is no statistically significant difference in the performance of third grade students in mathematics on a pre and post curriculum alignment basis (1996-1997) as measured

by the Iowa Tests of Basic Skills when analyzed by gender using NCE scores for 1996 compared to matched NCE scores for 1997.

TABLE 7

ONE-WAY ANALYSIS OF VARIANCE OF THE EFFECTS OF CURRICULUM ALIGNMENT USING THE MEANS OF DIFFERENCES OF PRE AND POST TEST NCE SCORES WHEN ANALYZED BY GENDER

Source	df	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	1	52.5314	89.097	2.7526	.0995
Within Groups	133	2519.1045	19.0841		
Total	133	2571.6359			

Groups		Count	Mean	Standard Deviation	Standard Error
Group	1 (male)	67	4.5358	4.2479	.5190
Group	2 (female)	67	5.7881	4.4860	.5480
Total		134	5.1619	4.3972	.3799

The analysis yielded an F ratio (2.7526) and a F probability (.0995) which was not significant at the .05 level. The null hypothesis is, therefore, accepted.

Ho5

Ho5 There is no statistically significant difference in the performance of third grade students in mathematics on pre and post curriculum alignment basis (1996-1997) as measured by the Iowa Tests of Basic Skills when analyzed by school size using NCE scores for 1996

compared to matched NCE scores for 1997.

TABLE 8

ANALYSIS OF VARIANCE OF THE EFFECTS OF CURRICULUM ALIGNMENT USING THE MEANS OF DIFFERENCES OF PRE AND POST TEST NCE SCORES WHEN ANALYZED BY SCHOOL SIZE

Source	df	Sum of Squares	Mean Squares	F Ratio	F Probability
Between Groups	2	.6161	.3080	.0173	.9829
Within Groups	64	1141.8857	17.8420		
Total	66	1142.5018			

Groups	Count	Mean	Standard Deviation	Standard Error
Group 1 (200-800)	51	5.1275	4.3340	.6069
Group 2 (801-1000)	12	5.2833	3.9374	1.1366
Group 3 (1000+)	4	5.4750	3.2745	1.6373
Total	67	5.1761	4.1606	.508

The null hypothesis is, therefore, accepted.

There was a six-point NCE gain, from 49 to 55 or a 6.00 points in the 4,665 scores of all matched third grade students on the Iowa Tests of Basic Skills. With this study group the aggregate scores of 67 schools have respective mean scores of 51.57 and 56.69 in 1996 and 1997, respectively. This resulted in a 5.12 gain.

Summary for the Analysis

The difference in the overall pre- and post test scores was statistically significant when using a t-test. The first hypothesis was rejected: all other hypotheses were accepted. There is no statistically significant difference in the effects of curriculum alignment after one year of treatment when analyzed by socioeconomic levels, race, gender and school size.

FINDINGS, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Findings

The null hypothesis Ho1 was rejected and the null hypotheses Ho2-4 were accepted. These data indicate that there was a significant difference in the effects of curriculum alignment when used as a treatment to increase student achievement in mathematics as measured by student achievement demonstrated by the Iowa Tests of Basic Skills. The data further indicate that there is not a significant difference in the effects of curriculum alignment according to socioeconomic level, race, gender and school size when using aggregate scores of the mathematics subtest of the Iowa Tests of Basic Skills.

Using Analysis of Variance, the data revealed that there is not a significant statistical difference in the performance levels of third grade students of varying socioeconomic levels. The three groups were represented in the following ways: high poverty (low SES 50-100%) of students receiving free or reduced lunches; moderate poverty (mod SES 24.99-49.99%) of students receiving free and reduced lunches; and low poverty (high SES 1-24%) of students receiving free or reduced lunches. Despite the lack of statistical significance difference among

and between groups, gains were recorded for *all* groups. The total mean NCE gain for all students in the study was 5.1761. With respect to socioeconomic level, the greatest impact of curriculum alignment was realized with the moderate poverty range with a mean NCE gain of 5.84. The data for the Analysis of Variance with respect to socioeconomic level indicated that which was consistent with Olsen (1997) in his commentary about middle class (moderate poverty) Blacks being responsible for gains in Black scoring.

A similar commentary of the findings could be given concerning race. Whereas, there was no statistically significant difference in the performance levels of Black and non-Black students, there was a 1.6 difference in the means of the pretest and posttest score gains. The Black group mean difference was 4.8582 and the group mean of the non-Black students was 6.5015. Curriculum alignment appears to be an effective instructional tool for raising student achievement among Blacks.

With respect to gender, the aggregate student scores follow the pattern of the first two sets of data generated in response to their null hypotheses respectively. There is no statistically significant difference in the scores of male and scores of females in mathematics on the Iowa Tests of Basic Skills when comparing the means of the gains when comparing pretest and posttest scores. However, there was desirable growth in academic achievement in both groups, even with females gains 1.2 points beyond males. The growth for male students was, nevertheless, substantial with a mean gain of 4.5 points. The female advantage was consistent with Irvine (1991).

As previously stated there was no statistically significant difference in the performance of students as measured by the differences of the means of pre- and post-test scores when analyzed

by school size. There was more gain among students in school over 800 which is contrary to Lamdin (1995). This may be due in part to the tendency for the larger schools in DeKalb County School to be in the southeastern section of the County--a high growth area for progressive families.

Conclusions

Curriculum Alignment when used in a large metropolitan school system appears to have a significant positive effect on the student achievement of all third graders in mathematics. This is evident by the overall significant NCE mean score gains of *all* matched third graders who performed above one year's gain on the Iowa Tests of Basic Skills. As noted in Chapter Five, there was a six-point NCE gain, from 49-55 points in the 4,665 scores of all matched third grade students on the Iowa Tests of Basic Skills. These data were a motivating backdrop against which the researcher could analyze the information sought in this study: the impact of curriculum alignment specifically on the socioeconomic levels, race, gender and school size.

In the unilateral absence of statistically significance with respect to socioeconomic status, race, gender and school size, a more powerful assertion arises. The data give rise to a conclusion that reinforces the use of curriculum alignment as a teaching tool that delivers equity in instruction for third graders, at least, in mathematics. In essence, there were desirable gains despite the traditional predictors of poor student achievement--low socioeconomic status, being Black, being male, and learning in a school with over 800 children!

Implications

Since all of the null hypotheses involving intervening variables were accepted, in a study

on a topic with little surrounding research, the implications are fruitful. Implications of this study are addressed to educational administrators who implement policy and/or write curriculum for schools and/or school systems. Implications center around two key themes: standards and evaluation; and, curriculum development and equity.

Recommendations

1. Further investigation in needed in expanding the scope of scrutiny for curriculum alignment to various subjects areas and grade levels.

2. Additional information is needed on the degree of compliance with curriculum alignment to include information on teacher comfort level in keeping with Bright (1992) and the use of the perceived ethics continuum for test preparation.

3. Further investigation is needed in the area of various interpretations of curriculum alignment.

4. Longitudinally data-gathering is needed to examine the long-term effects of curriculum alignment.

5. A strong recommendation for school leaders is to develop curriculum which is aligned to assessment and current practices for effective teaching. Whereas there are school reform efforts to change the curriculum to include more student-centered activities, this presents a conflict with the demands for raised test scores. McCaslin and Good (1992, abstract) reported, "the intended modern school curriculum, designed to produce a self-motivated, active learner, is undermined by classroom policies that emphasize simple obedience." Curriculum alignment should be used to sanction increased use of drill and practice solely for increasing scores on standardized achievement tests.

6. Additional investigation is needed to evaluate the implications of standards-based schooling,

as a reform effort, and its relationship to curriculum alignment. Williams (1998, 3) stated:

The latest initiative in education is standards-based schooling. The alignment of what we want students to learn and be able to do coupled with how we teach to achieve and assess this learning is critical and central to standards-based schooling...The new meaning for teachers raises serious questions about our commitment to redesigning professional development programs so that they can in fact become coaches and facilitators of learning. It also raises questions about the critical issues pertaining to the short time span we have for redesigning teacher preparation programs and addressing the issues associated with the critical shortage of teachers and the market demand for millions of new teachers at the beginning of the new century. The language of standards is similar, and in some instances identical, to curriculum alignment.

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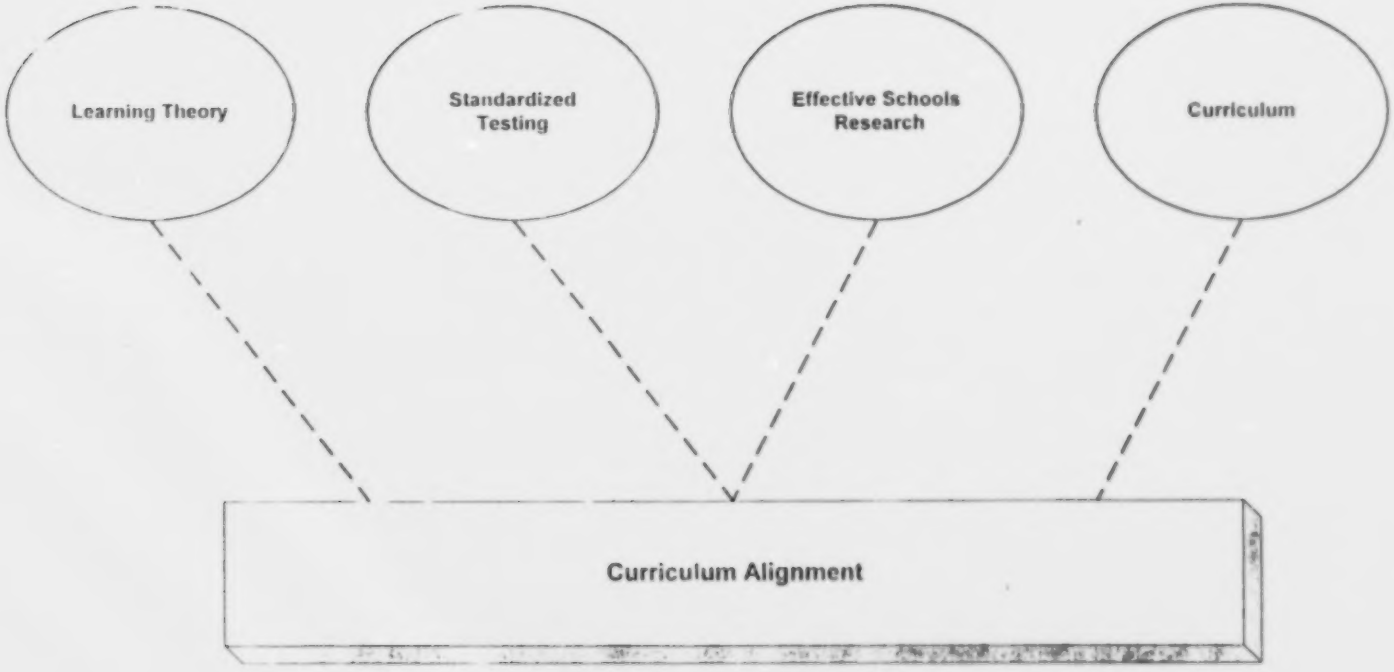
APPENDIX A

The historical constructs of curriculum alignment.

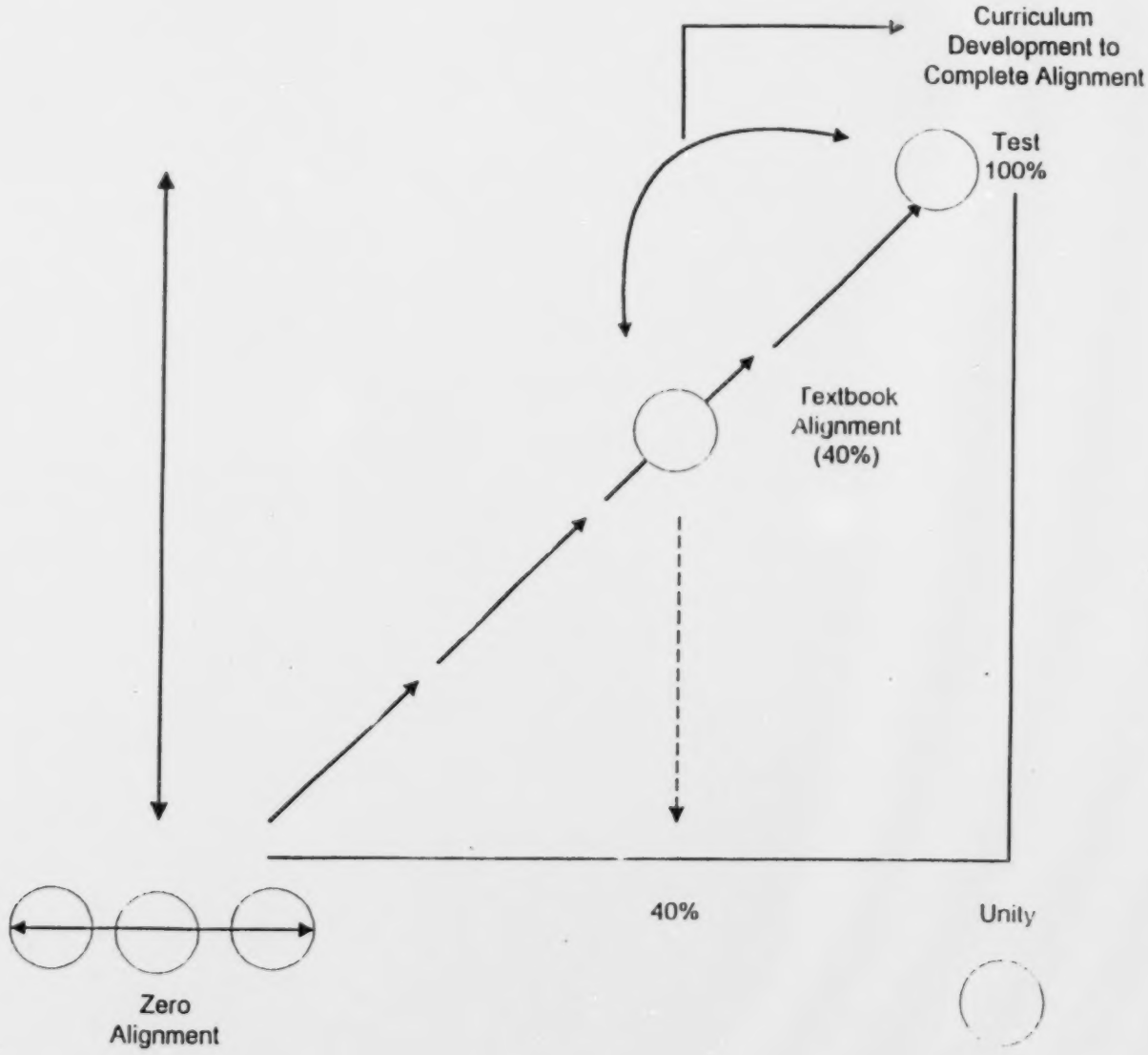

Learning Theory
Standardized Testing
Effective Schools Research
Curriculum
Curriculum Alignment

APPENDIX B

Fenwick W. English (1992)

Deciding What To Teach And Test

Preliminary Alignment Practices, page 83


Curriculum
Development to
Complete Alignment
Test
100%
Textbook
Alignment
(40%)
40%
Unity
Zero
Alignment

APPENDIX C

Review of the Literature for Curriculum Alignment

Review of the Literature for Curriculum Alignment

Historical Constructs	Proponents	Opponents	Questioning Standardized Testing/Impact on Teaching	Variables Impacting Standardized Test Scores
Learning Theory Thorndike, 1913, 1924 Gestalt Theory, 1924	Olivero, 1984	Haladyna, Nolen and Haas, 1991 "Pollution"	Hilliard, 1987 Testing without cultural context is invalid	*SES* Davis, 1957 English, 1992 Garibaldi, 1996 Bracey, 1997 Prospects, 1997
Effective School Research Edmonds, 1979 Northwest Regional Lab, 1995	English, 1992	Mehrens and Kaminski, 1989 continuum of "ethics" used by Popham, 1991 and Bright, 1992	Chira, 1992 Drill and Practice	*School Size* Lamdin, 1995 "Boomlets"
Curriculum "Hidden" Oliver, 1997 Teach what you test Gagne, 1965	Leitzel, 1994	Cannell, 1990 "Cheating"	Berliner and Biddle, 1995	*Race,* Irvine, 1990 Bracey, Oliver 1997 NAEP scores
Measurement Socio-Political--standards Bracey, 1997 WYTIWYG	Costa, 1997	Bracey, 1997 Prince George's County Experience	Bracey, 1997	*Gender* Irvine, 1990
Earlier terms "congruence" Brickwell, 1976 "overlap" Leinhardt & Seewald, 1981	Mehrens and Kaminsky, 1991	Kansas City School District	Mitchell, 1992 "Assessment"	*Curriculum Alignment* Wishnick, 1989 Cohen, 1987 AEL, 1999 (Virginia School Divisions)
	DeKalb County, Jenkins County, Habersham County, Texas		Weiss and Fege, 1988 "Dictate"	